REMARKS

This application has been carefully reviewed in light of the Office Action dated July 9, 2004. None of the claims have been amended.

Claims 22-35 and 58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chiang in view of Moslehi. The rejection is respectfully traversed.

The Office Action acknowledges that Chiang does not "disclose the method of forming the heat-radiating passivation layer of aluminum nitride, wherein said heat-radiating layer is formed from approximately 100 angstroms to 1000 angstroms thick." (Office Action, pg. 3). The Office Action relies upon Moslehi for this shortcoming of Chiang. Specifically, Moslehi's Col. 14, lines 16-60 and Col. 15, lines 1-24 are cited as support. Applicant, however, respectfully disagrees.

Moslehi's Col. 14, lines 16-60 discloses two deposition processes to form two separate layers over the metallization structure. The first deposition process deposits a first layer substantially conformal to a controlled thickness of 50 Å to 200 Å of a dielectric material such as AlN (Col. 14, lines 19-22). This layer covers the exposed surface areas of the multi-level metallization structure. "The main purpose of this conformal dielectric . . . is to prevent or suppress thermionic emission and/or low-voltage electrical breakdown." (Col. 14, lines 32-36). This first layer, however, is not a heat-radiating layer, much less a passivation layer.

The second deposition process deposits a second layer that is substantially non-conformal to form a hermetically-sealed top insulating passivation overlayer (Col. 14, lines 42-45). Thus, Moslehi's second layer is the top passivation layer. Moslehi's Col. 14, however, does not teach or suggest a thickness for the second layer, much less one that is a heat-radiating layer. Accordingly, Moslehi's Col. 14, lines 14-60 does not

teach or suggest Applicant's claimed heat-radiating layer that is "approximately 100 Å to approximately 1000 Å thick," as recited in claims 22, 29, and 58.

Moslehi's Col. 15, lines 1-24 also do not teach or suggest applicant's claimed heat-radiating layer that is approximately 100 Å to approximately 1000 Å thick. In this method embodiment, Moslehi discloses three separate deposition steps to form three separate layers over the metallization structure. Again, the top layer is the passivation layer. In this case, however, the top layer has a minimal disclosed thickness of 5000 Å.

The first layer is an atmospheric low-temperature silicon dioxide deposition that is partially conformal on the metallization structure (Col. 15, lines 2-5). The second layer is silicon nitride or silicon oxynitride that is about 5000 Å thick. The third and final layer is of a high-thermal conductivity insulating material such as aluminum nitride (Col. 15, lines 9-11). Moslehi's third layer, however, is formed to be from 5000 Å to over 1 μm thick (Col. 15, line 9). Moslehi's high-thermal conductivity layer is not formed to be approximately 100 Å to approximately 1000 Å thick as Applicant claims. Moslehi's layer is at least five times thicker than Applicant's claimed heat-radiating layer's thickness.

As such, Chiang and Moslehi do not teach or suggest a method of forming a copper interconnect structure by, "forming a heat-radiating layer on an upper surface portion of said copper conductor, said heat-radiating layer comprising aluminum nitride passifying said upper surface portion of said copper conductor, wherein said heat-radiating layer is formed from approximately 100 Å to approximately 1000 Å thick," as recited in claim 1.

Chiang and Moslehi do not teach or suggest a method of forming an interconnect structure by "forming a heat-radiating layer comprising aluminum nitride on an upper surface portion of said conductor, said aluminum nitride layer providing a

heat dissipating path for said conductor, wherein said heat-radiating layer is formed from approximately 100 Å to approximately 1000 Å thick," as recited in claim 29.

Similarly, Chiang and Moslehi do not teach or suggest a method of forming a copper interconnect structure by "forming a heat-radiating layer on an upper surface portion of said copper conductor, said heat-radiating layer comprising a continuous layer of aluminum nitride passifying said upper surface portion of said copper conductor, wherein said heat-radiating layer is formed from approximately 100 Å to approximately 1000 Å thick," as recited in claim 58.

For at least these reasons, independent claims 22, 29 and 58 are allowable over the cited references. Claim 23-28 depend from claim 22 and are similarly allowable along with claim 22. Claim 30-35 depend from claim 29 and are similarly allowable along with claim 29.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

By_____

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